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PATENT & TRADEMARK OFFICE

10/622368

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	

Application Number	Patent#: 7,173,640
Filing Date	Issued: February 6, 2007
First Named Inventor	Céline Mas et al.
Art Unit	2674
Examiner Name	S. G. Sherman
Attorney Docket Number	S1022.81025US00

ENCLOSURES (*Check all that apply*)

- [ ] Fee Transmittal Form
  - [ ] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [x] Request for Certificate of Correction
- [x] Certificate of Correction
- [x] Cols. 1 and 6 of Issued 7,173,640
- [x] Copy of page 1 of Application as Filed
- [x] Copy of Page 3 of August 31, 2006 Amendment
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
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- [ ] CD, Number of CD(s) _____
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- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (please Identify below):

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Remarks

Certificate of Correction FEB 16 2007

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	WOLF, GREENFIELD & SACKS, P.C.		
Signature			
Printed name	James H. Morris		
Date	February 9, 2007	Reg. No.	34,681

Certificate of Mailing Under 37 CFR 1.8(a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the U.S. Postal Service on the date shown below with sufficient postage as First Class Mail, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dated: February 9, 2007

Signature: Gail Driscoll (Gail Driscoll)

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- [x] Other Enclosure(s) (please Identify below):

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Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

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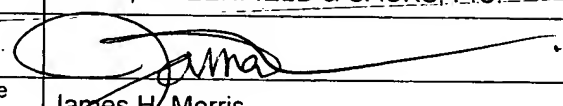
Signature			
Printed name	James H. Morris		
Date	February 9, 2007	Reg. No.	34,681

Certificate of Mailing Under 37 CFR 1.8(a)

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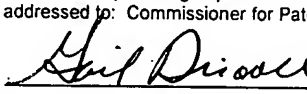
Signature:  (Gail Driscoll)

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Docket No.: S1022.81025US00
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Céline Mas et al.	
Serial No.:	10/622,368	Patent No. 7,173,640
Filed:	July 18, 2003	Issued: February 6, 2007
For:	DISPLAY OF AN IMAGE ON AN ARRAY SCREEN BY SELECTIVE ADDRESSING OF SCREEN LINES	
Examiner:	S. G. Sherman	
Art Unit:	2674	Confirmation No. 5360

Certificate of Mailing Under 37 CFR 1.8(a)
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Dated: February 9, 2007

Gail Driscoll

REQUEST FOR CERTIFICATE OF CORRECTION
PURSUANT TO 37 CFR 1.322

Attention: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir/Madam:

Upon reviewing the above-identified patent, Patentee noted typographical errors which should be corrected.

In the Specification:

In issued U.S. Patent No. 7,173,640, column 1, line 46, the word "base" should be corrected to read "case" as shown on page 1, line 32 of the application as filed. Column 1, line 46 should read as shown below.

--diodes can then be obtained more rapidly. In the case where--

FEB 16 2007

In the Claims:

The word "the" was deleted from the fourth line of claim 7 as amended in the amendment filed August 31, 2006. However, "the" still appears in claim 7, column 6, line 52, of issued U.S. Patent No. 7,173,640.

Column 6, line 52, should read as shown below.

--state when a corresponding pixel is to be activated;--

There is no amendment of record in this application by either Patentees or the Examiner requesting the above changes. Further, the above listed changes are not clarifying, practical or desirable.

In support of this Request Patentees enclosed highlighted copies of page 1 of the application as filed, page 3 of the August 31, 2006 amendment and columns 1 and 6 of issued U.S. Patent No. 7,173,640.

Patentees respectfully submit that, since the errors for which a Certificate of Correction is sought was the result of Patent Office mistake, no fee is due. However, if the Examiner deems a fee necessary, the fee may be charged to the account of the undersigned, Deposit Account No. 23/2825.

Transmitted herewith is a proposed Certificate of Correction effecting such amendments. Patentees respectfully solicit the granting of the requested Certificate of Correction.

Dated: February 9, 2007

Respectfully submitted,

By: _____

James H. Morris
Registration No.: 34,681
WOLF, GREENFIELD & SACKS, P.C.
Federal Reserve Plaza
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FEB 16 2007

DISPLAY OF AN IMAGE ON AN ARRAY SCREEN BY SELECTIVE ADDRESSING OF SCREEN LINES

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a method and a device for displaying an image on an array screen by activation of screen pixels arranged in rows and columns.

2. Discussion of the Related Art

The present invention especially applies to array screens in which each pixel is formed of a light-emitting diode, for example, of organic or polymer nature (OLED-type screen, for Organic Light-Emitting Display, or PLED, for Polymer Light-Emitting Display). The cathodes of the diodes of a same line are connected to a row electrode and the anodes of the diodes of a same column are connected to a column electrode.

The display of an image on screen, according to usual standards, is obtained by the display of a frame or of two successive frames. Upon display of a frame, the addressing of an array screen is performed row after row via a row control circuit (commonly called the row driver). In the case of an array screen with diodes, the row electrode of the active row may be grounded while the other row electrodes may be left at high impedance or be connected to a high voltage. Simultaneously, the information corresponding to the activation or to the non-activation of the row pixels will be transmitted by the column electrodes via a column control circuit (column driver) which injects or does not inject a current into each electrode column to turn on or to not turn on the column pixel.

It is possible for no pixel of one or several rows to be on upon display of several successive frames, for example, in some applications for portable phone screens or electronic diary screens. Now, such lines will be however activated upon successive addressing of all the screen lines. The power necessary for the row driver to address lines where no pixel is turned on is then uselessly wasted.

Further, in the case of an array screen with light-emitting diodes, upon activation of a row, there often is a previous step of precharge of all the diodes of the row to a voltage close to the threshold voltage. The possible turning-on of the diodes can then be obtained more rapidly. In the base where no pixel in the row is to be activated, the power required for the precharge step is uselessly wasted.

SUMMARY OF THE INVENTION

The present invention aims at a method and a device for displaying an image on an array screen by activation of screen pixels arranged in rows and columns enabling power saving.

The present invention also aims at a method and a device for displaying an image on an array screen with diodes enabling improving of the pixel screen lifetime.

To achieve these and other objects, the present invention provides a method for displaying an image on an array screen by activation of screen pixels arranged in rows and columns, each pixel of a same row corresponding to a memory point of a same row of the memory, said memory point being set to an activation state when the corresponding pixel is to be activated, comprising the steps of identifying, among sets of the memory rows, the row sets for which at least one memory point of a row of the set is at the activation state; and successively selecting the only lines corresponding to the rows of the sets of rows identified for the pixel activation.

According to an embodiment of the present invention, the first step comprises the steps of setting, for each row of the memory, a memory point of an auxiliary memory to the activation state if at least one memory point of the row is at the activation state; determining the memory points of the auxiliary memory at the activation state; and identifying the row blocks corresponding to said memory points of the auxiliary memory in the activation state.

According to an embodiment of the present invention, the first step comprises the steps of setting, for each row of the memory, a memory point of an auxiliary memory to the activation state if a memory point of the row is set to the activation state; determining the memory points of the auxiliary memory in the activation state; and identifying the row blocks corresponding to said memory points of the auxiliary memory in the activation state.

According to an embodiment of the present invention, the method further comprises the steps of reading, for each selected row, the states of the memory points of the selected row; and setting a memory point of the auxiliary memory to the deactivation state if all the memory points of the row are in the deactivation state.

According to an embodiment of the present invention, the method further comprises, before the second step, the steps of determining a clock signal for reading the number of sets of identified rows, the lines of the screen being selected at the frequency of said read clock signal.

According to an embodiment of the present invention, the frequency of the read clock signal multiplied by the total number of rows of the sets of identified rows is substantially constant.

According to an embodiment of the present invention, when a set of rows has contained at least one memory point in the activation state for the display of a determined image, the lines of the screen corresponding to said set of rows is selected, at least for the display of the next image, even if all the memory points of said set of rows are in the deactivation state.

The present invention also provides a device for displaying an image on an array screen by activation of screen pixels arranged in lines and columns, comprising a main memory, each pixel of a same screen line corresponding to a memory point of a same row of the main memory, said memory point being set to an activation state when the corresponding pixel is to be activated; an addressing means for successively providing row addresses of the main memory; a read means, receiving said successive identifiers, and adapted to read, for each address, the states of the memory points of the corresponding row; a row driver for selecting screen lines based on the addresses; and a column driver for activating pixels of the selected lines, further comprising a means for identifying, among sets of memory rows, sets of rows for which at least one memory point of a row in the set is in the activation state, and the addressing means is adapted to successively providing the row addresses of the identified row sets.

According to an embodiment of the present invention, the device comprises a means for providing a read control signal transmitted to the addressing means, the frequency of which depends on the total number of rows of the identified row sets.

According to an embodiment of the present invention, the device further comprises an auxiliary memory connected to the identification means and each memory point of which is

FEB 16 2007 FEB 16 2007

point of said row is at 1. If it is so, reading interface **24** transmits to auxiliary memory **28** a signal so that the memory point of auxiliary memory **28** associated with said read row is set to 1 or transmits no signal to auxiliary memory **28**.

In the case where all the pixels of address row $R_{ADDRESS}$ of main memory **20** are at zero, reading interface **24** transmits to auxiliary memory **28** a signal so that the memory point of auxiliary memory **28** corresponding to said row is set to zero.

In the second embodiment according to the present invention, the modifications of the states of the memory points of auxiliary memory **28** are thus performed at two different steps. Indeed, the writing interface enables indicating that a memory point is set to state **1** and thus that the row block to which said memory point belongs must be selected upon display. Reading interface **24** may enables determining that all the memory points of a row block are at 0, and thus that the lines associated with this block will not be activated upon display of the next frame if the memory points of the rows of said row block are maintained at 0. The second embodiment enables use of a conventional main memory **20**.

According to an alternative of the two embodiments, when at least one of the memory points of auxiliary memory **28** associated with a row block is at 1, and thus the block is "active" and, upon display of the next frame, all the memory points of the block are at 0, decision unit **30** can decide to maintain the block "active". The corresponding rows of screen **10** will thus be activated upon display of the next frame. This enables avoiding too frequent activation and deactivation changes for the rows of screen **10**. The maintaining in the "active" state of a row block only comprising memory points at 0 may extend over several successive frames.

The present invention enables saving power by reducing the number of screen lines activated in the case where all the pixels of some rows are off. In the case of an array screen with diodes for which a precharge of the diodes is performed before turning on the pixels, the present invention enables avoiding the row charges and discharges where all the pixels are off.

Further, the present invention enables increasing the period of read clock signal R_{CLK} with respect to a display in which all the screen lines would be systematically activated. In the specific case of an array screen with diodes, the luminance emitted by a pixel is proportional to the on duration of said pixel. The increase of the period of read signal R_{CLK}, which corresponds to the duration of activation of a screen row, then enables, for a same luminance, decreasing the amplitude of the control signal to be provided to the pixel. This thus enables further decreasing the total consumption of the array screen and improving of the pixel lifetime.

Of course, the present invention is likely to have various alterations, modifications, and improvements which will readily occur to those skilled in the art. Such alterations, modifications, and improvements are intended to be part of this disclosure, and are intended to be within the spirit and the scope of the present invention. Accordingly, the foregoing description is by way of example only and is not intended to be limiting. The present invention is limited only as defined in the following claims and the equivalents thereto.

What is claimed is:

1. A method for displaying an image on an array screen by activation of screen pixels arranged in lines and columns, each pixel of a same line corresponding to a memory point of a same row of a memory, said memory point being set to an activation state when a corresponding pixel is to be activated, comprising the steps of:

identifying, among sets of memory rows, the row sets for which at least one memory point of a row of the set is at the activation state;

determining a read clock signal based on the number of sets of identified rows; and

successively selecting, at the frequency of said read clock signal, each line corresponding to the rows of the sets of rows identified for the pixel activation.

2. The method of claim **1** wherein the first step comprises the steps of:

setting, for each row of the memory, a memory point of an auxiliary memory to the activation state if at least one memory point of the row is at the activation state;

determining the memory points of the auxiliary memory at the activation state; and

identifying the row blocks corresponding to said memory points of the auxiliary memory in the activation state.

3. The method of claim **1**, wherein the first step comprises the steps of:

setting, for each row of the memory, a memory point of an auxiliary memory to the activation state if a memory point of the row is set to the activation state;

determining the memory points of the auxiliary memory in the activation state; and

identifying the row blocks corresponding to said memory points of the auxiliary memory in the activation state.

4. The method of claim **3**, further comprising the steps of:

reading, for each selected row, the states of the memory points of the selected row; and

setting a memory point of the auxiliary memory to the deactivation state if all the memory points of the row are in the deactivation state.

5. The method of claim **1**, wherein the frequency of the read clock signal multiplied by the total number of rows of the sets of identified rows is substantially constant.

6. The method of claim **1**, wherein when a set of rows has contained at least one memory point in the activation state for the display of a determined image, the lines of the screen corresponding to said set of rows are selected, at least for the display of the next image, even if all the memory points of said set of rows are in the deactivation state.

7. A device for displaying an image on an array screen by activation of screen pixels arranged in lines and columns, comprising:

a main memory, each pixel of a same screen line corresponding to a memory point of a same row of the main memory, said memory point being set to an activation state when the corresponding pixel is to be activated;

an addressing means for successively providing row addresses of the main memory;

a read means, receiving said successive row addresses, and adapted to read, for each address, the states of the memory points of the corresponding row;

a row driver for selecting screen lines based on the addresses; and

a column driver for activating pixels of the selected lines,

comprising a means for identifying, among sets of memory rows, sets of rows for which at least one memory point of a row in the set being in the activation state, a means for providing a read control signal transmitted to the addressing means, the frequency of which depends on the total number of rows of the identified row sets and wherein the addressing means is

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DISPLAY OF AN IMAGE ON AN ARRAY SCREEN BY SELECTIVE ADDRESSING OF SCREEN LINES

Background Of The Invention

1. Field of the Invention

The present invention relates to a method and a device for displaying an image on an array screen by activation of screen pixels arranged in rows and columns.

2. Discussion of the Related Art

The present invention especially applies to array screens in which each pixel is formed of a light-emitting diode, for example, of organic or polymer nature (OLED-type screen, for Organic Light-Emitting Display, or PLED, for Polymer Light-Emitting Display). The cathodes of the diodes of a same line are connected to a row electrode and the anodes of the diodes of a same column are connected to a column electrode.

The display of an image on screen, according to usual standards, is obtained by the display of a frame or of two successive frames. Upon display of a frame, the addressing of an array screen is performed row after row via a row control circuit (commonly called the row driver). In the case of an array screen with diodes, the row electrode of the active row may be grounded while the other row electrodes may be left at high impedance or be connected to a high voltage. Simultaneously, the information corresponding to the activation or to the non-activation of the row pixels will be transmitted by the column electrodes via a column control circuit (column driver) which injects or not a current into each electrode column to turn on or not the column pixel.

It is possible for no pixel of one or several rows to be on upon display of several successive frames, for example, in some applications for portable phone screens or electronic diary screens. Now, such lines will be however activated upon successive addressing of all the screen lines. The power necessary for the row driver to address lines where no pixel is turned on is then uselessly wasted.

Further, in the case of an array screen with light-emitting diodes, upon activation of a row, there often is a previous step of precharge of all the diodes of the row to a voltage close to the threshold voltage. The possible turning-on of the diodes can then be obtained more rapidly. In the case where no pixel in the row is to be activated, the power required for the precharge step is uselessly wasted.

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setting a memory point of the auxiliary memory to the deactivation state if all the memory points of the row are in the deactivation state.

5. (Original) The method of claim 1, wherein the frequency of the read clock signal multiplied by the total number of rows of the sets of identified rows is substantially constant.

6. (Original) The method of claim 1, wherein when a set of rows has contained at least one memory point in the activation state for the display of a determined image, the lines of the screen corresponding to said set of rows are selected, at least for the display of the next image, even if all the memory points of said set of rows are in the deactivation state.

7. (Currently Amended) A device for displaying an image on an array screen by activation of screen pixels arranged in lines and columns, comprising:

a main memory, each pixel of a same screen line corresponding to a memory point of a same row of the main memory, said memory point being set to an activation state when ~~the~~ a corresponding pixel is to be activated;

an addressing means for successively providing row addresses of the main memory;

a read means, receiving said successive row addresses, and adapted to read, for each address, the states of the memory points of the corresponding row;

a row driver for selecting screen lines based on the addresses; and

a column driver for activating pixels of the selected lines,

comprising a means for identifying, among sets of memory rows, sets of rows for which at least one memory point of a row in the set being in the activation state, a means for providing a read control signal transmitted to the addressing means, the frequency of which depends on the total number of rows of the identified row sets and wherein the addressing means is adapted to successively ~~providing~~ provide the row ~~addresses~~ address of each row of the identified row sets at the frequency of the read control signal.

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,173,640

APPLICATION NO. : 10/622,368

ISSUE DATE : February 6, 2007

INVENTOR(S) : Céline Mas, Eric Benoit, Olivier Scouarnec and Olivier Le Briz

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Col. 1, line 46, should read:
--diodes can then be obtained more rapidly. In the case where--

Col. 6, line 52, should read:
--state when a corresponding pixel is to be activated;--

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